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| 10/823,895 | 04/13/2004 | Michael A. Rothman | P19009 | 5656 |

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| EXAMINER | |
|---|---|
| YU, JAE UN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2185 | |

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/823,895 | ROTHMAN ET AL. | |
| | Examiner | Art Unit | |
| | Jae U. Yu | 2185 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

The examiner acknowledges the applicant's submission of the amendment dated 7/20/06. At this point claims 8, 17, 20, 27 and 31 have been amended. Thus, claims 1-31 are pending in the instant application.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 6-9, 10-12, 15-18, 19-21, 23-25 and 28-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Lawrence et al. (US 6,253,300).

2. **Independent claims 1, 10, 19 and 23** discloses, "circuitry, a storage controller and an article of manufacture that are enabled to" perform the following method. **Lawrence et al. disclose the following method that is executed in a computer system. Therefore, the computer system inherently includes the "circuitry, a storage controller and an article of manufacture" from the claim.**

"Receiving an I/O request **[Copy request, Column 5, Lines 37-39]** to an object **["File", Column 5, Lines 37-39]** in storage **["Storage Medium", Column 5, Line 42]**"

"Defragmenting the object in storage **[Defragmenting the file in storage, Column 5, Lines 37-39]** so that blocks in storage including the object are contiguously **["Stored in contiguous region of the storage medium", Column 5, Lines 41-42]** in response to receiving the I/O request **[Running a defragmentation program before the copy operation, Column 5, Lines 37-39]**"

"Executing the I/O request with respect to the object in storage **[Copying the files in storage, Column 5, Lines 37-39]**"

3. **Claims 2, 11 and 24** disclose, "the I/O request is executed with respect to the object after defragmenting the object". **Lawrence et al. disclose copying file ("I/O request to the object" from the claim) after running a defragmentation program in column 5, Lines 37-39.**

4. **Claims 3, 12, 20 and 25** disclose, "determining whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold **[Any amount of fragmentation higher than zero, Column 5, Lines 37-39]** in response to receiving the I/O request, wherein the object is defragmented **[Eliminating fragmentation on the file, Column 5, Lines 37-39]** if the amount of fragmentation exceeds the fragmentation threshold **[If fragmentation exists, Column 5, Lines 37-39]**".

5. **Claims 6, 15 and 28** disclose, "determining at least one logical partition **["Directory for each file", Column 5, Line 40]** including the object, wherein the object is defragmented if the object is within one logical partition **[Defragmenting the file within the directory, Column 5, Lines 37-40]**".

6. **Claims 7, 16 and 29** disclose, "determining whether the object is read-only, wherein the object is defragmented if the object is not read-only". **Read-only means that the object is write-protected. Since defragmenting comprises the process of copying/deleting of an object to a different location, Lawrence et al. inherently defragment only "not write-protected" ("not read-only" from the claim) objects.**

7. **Claims 8-9, 17-18 and 30-31** disclose, "the operation of receiving the I/O requests, initiating the operation to defragment the object, and executing the I/O request of defragmenting the object in storage is performed by a storage controller managing I/O requests to the storage and a device driver for the storage providing an interface to the storage". **Lawrence et al. disclose the operation of defragmenting the object in storage in a computer system. Therefore, the computer system inherently includes the "storage controller" and the "device driver" from the claim.**

8. **Claim 21** discloses, "the storage controller and storage device are included in the same housing **[Computer System]**". **Lawrence et al. disclose defragmenting in a**

**computer system that inherently includes the "storage controller" and the "storage device" from the claim.**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claim 22 is rejected under 35 U.S.C. 103 (a) as being obvious over Lawrence et al. (US 6,253,300) in view of Karger et al. (US 5,339,449).

2. As per **claim 22**, Lawrence et al. disclose, "a processor **[Computer System]**".

Lawrence et al. do not disclose expressly, "a memory enabled to store the I/O request before the I/O request is received by the storage controller".

**Karger et al. disclose the I/O request queue in column 20, at lines 47-50.**

Lawrence et al. and Karger et al. are analogous art because they are from the same field of endeavor of memory management.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by including an I/O request queue as taught by Karger et al. in column 20, at lines 47-50.

The motivation for doing so would have been to process the I/O requests based on their priorities in the queue as expressly taught by Karger et al. in column 20-21, at Lines 67-5.

Therefore, it would have been obvious to combine Karger et al. with Lawrence et al. for the benefit of prioritized I/O process to obtain the invention as specified in claim 22.

3. Claims 4-5, 13-14 and 26-27 are rejected under 35 U.S.C. (a) as being obvious over Lawrence et al. (US 6,253,300) in view of Douglis et al. (US 2005/0108075).

4. As per **claims 4-5, 13-14 and 26-27**, Lawrence et al. disclose, "performing defragmentation in response to receiving the I/O request".

Lawrence et al. do not disclose expressly, "determining whether a user settable flag indicates to perform defragmentation, wherein the object is defragmented if the flag indicates to perform defragmentation" and "executing the I/O request without performing defragmentation if the flag does not indicate to perform defragmentation".

**Douglis et al. disclose deferring defragmentation if there is restriction of power usage ("flag" from the claim) in paragraph 32, wherein the "flag" is user settable since an user can alternate between restricted power source (battery) and unlimited power source (wall outlet).**

Lawrence et al. and Douglis et al. are analogous art because they are from the same filed of endeavor of defragmentation.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by including a flag that defers defragmentation in case of battery use as taught by Douglis et al. in paragraph 32.

The motivation for doing so would have been adaptive control of application power consumption in a mobile computer as expressly taught by Douglis et al. in paragraph 2.

Therefore, it would have been obvious to combine Douglis et al. with Lawrence et al. for the benefit of efficient power consumption to obtain the invention as specified in claims 4-5, 13-14 and 26-27.

***Arguments Concerning Prior Art Rejections***

**1st Point of Argument**

Regarding claim 1, the applicant argues that Lawrence does not teach the claim limitation, "defragmenting the object in storage so that blocks in storage including the

object are contiguous *in response to receiving the I/O request*". However, Lawrence discloses a copy request (Column 6, Lines 11-19), which performs defragmentation ("defrag") before an actual copy operation in column 6, at lines 33-44.

**2nd Point of Argument**

Regarding claim 3, the applicant argues that Lawrence does not teach, "the object is defragmented if the amount of fragmentation exceeds the fragmentation threshold". Lawrence discloses defragmenting the object in response to receiving the I/O request (See the "1st Point of Argument" above). However, the defragmentation operation is not executed if no fragmentation exists in the system (i.e. zero fragmentation threshold).

**3rd Point of Argument**

Regarding claim 6, the applicant argues that Lawrence does not teach the claim limitation, "determining at least one logical partition including the object, wherein the object is defragmented if the object is within one logical partition". The examiner directs the applicant's attention to the corresponding claim rejection above. Lawrence expressly discloses defragmenting an object within a logical partition.

**4th Point of Argument**

Regarding claim 7, the applicant argues with the examiner's 'inherency' finding since the 'read-only' attribute can be overridden. However, the examiner interprets that

if a system 'overrides' the 'read-only' attribute of an object, then the object is not 'read-only' anymore (i.e. The object is no longer 'write-protected').

**5th Point of Argument**

Regarding claims 8, 17 and 30, the applicant argues that Lawrence does not teach the amended claim limitations. The examiner directs the applicant's attention to the corresponding claim rejection above.

**6th Point of Argument**

Regarding claims 8-9, 17-18 and 30-31, the applicant argues that Lawrence does not teach the claim limitation, "the operation of defragmenting the object in storage is performed by a device driver for the storage providing an interface to the storage" and "performed by a storage controller managing I/O requests to the storage". However, Lawrence clearly discloses the "operation of defragmenting the object in storage" (See the corresponding claim rejections above), which is a form of the "interface to the storage" and "I/O requests". Since Lawrence does perform the same operations that are executed by the "device driver" and the "storage controller", Lawrence inherently includes the "device driver" and the "storage controller".

**7th Point of Argument**

Regarding claim 4, the applicant argues that Douglis does not disclose an user settable flag. The examiner directs the applicant's attention to the corresponding claim

rejection above, wherein the examiner interprets the term "flag" as any kind of indication that is recognized by a computer system.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

A. Claims Rejected in the Application

Per the instant office action, claims 1-31 have received a second action on the merits and are subject of a second action final.

B. Direction of All Future Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Un Yu who is normally available from 9:00 A.M. to

5:30 P.M. Monday thru Friday and can be reached at the following telephone number: (571) 272-1133.

If attempts to reach the above noted examiner by telephone are unsuccessful, the Examiner's supervisor, Sanjiv Shah, can be reached at the following telephone number: (571) 272-4098.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

9/27/2006

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